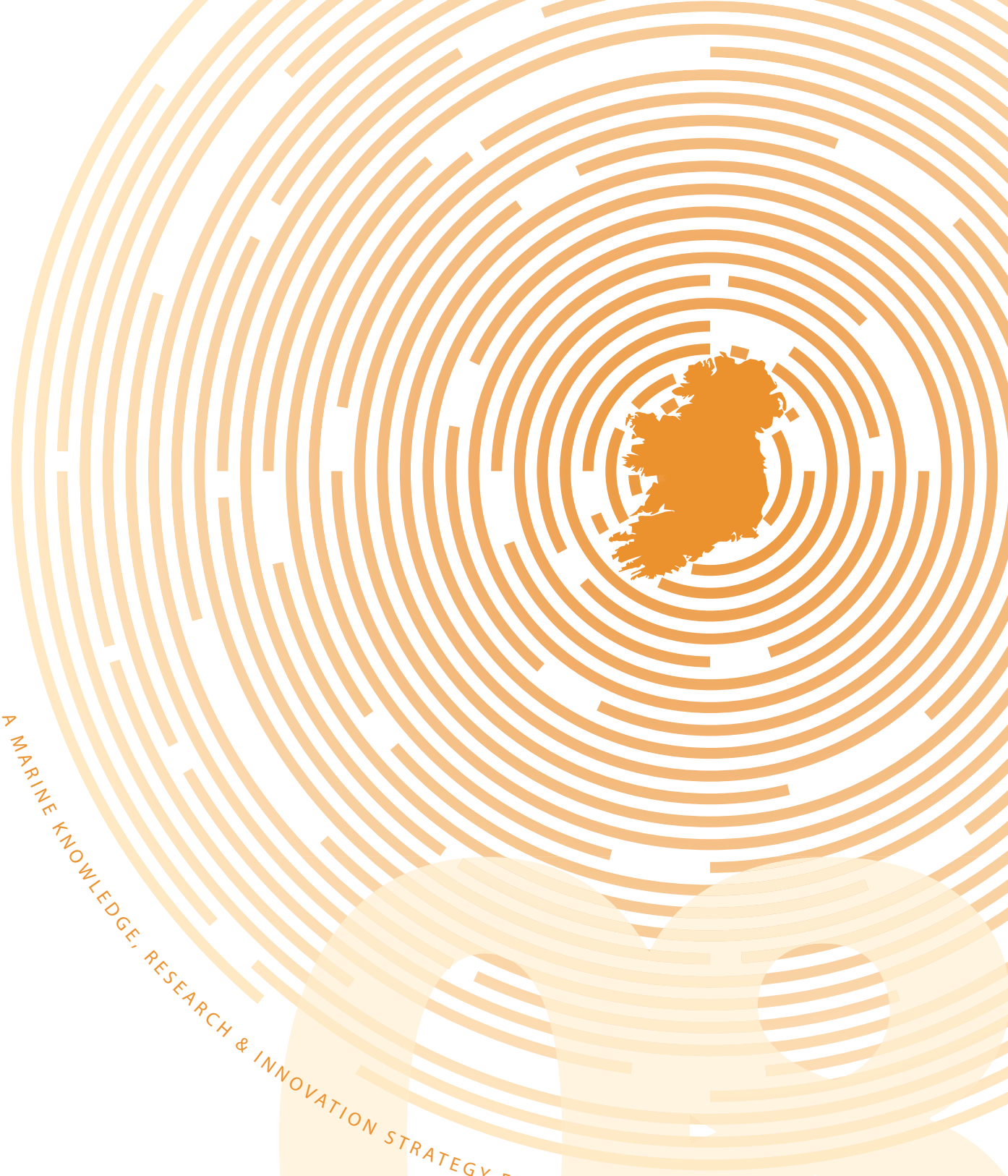

A MARINE KNOWLEDGE, RESEARCH & INNOVATION STRATEGY FOR IRELAND 2007–2013

SEA CHANGE

ANNUAL PROGRESS REPORT 2008

Marine Institute
Foras na Mara

SeaChange
Casadh na Taoide

to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to research and development that, in the opinion of the Institute, will promote economic development and create employment and protect the marine environment" Marine Institute Act 1991

Further copies of this publication can be obtained from: Marine Institute, Rinville, Oranmore, Co. Galway, Ireland.

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Contents

Preface

Sea Change—A Marine Knowledge, Research & Innovation Strategy for Ireland 2007-2013—was launched in early 2007 and was the outcome of an 18-month process of extensive analysis and consultation with government departments, state agencies, industry and the third-level sector. It outlines a vision for the development of Ireland's marine sector and sets clear objectives aimed at achieving this vision, namely to:

- Assist existing, and largely indigenous, marine sub-sectors to improve their overall competitiveness and engage in activity that adds value to their outputs by utilising knowledge and technology arising from research.
- Build new research capacity and capability and utilise fundamental knowledge and technology to create new marine-related commercial opportunities and companies.
- Inform public policy, governance and regulation by applying the knowledge derived from marine research and monitoring.
- Increase the marine sector's competitiveness and stimulate the commercialisation of the marine resource in a manner that ensures its sustainability and protects marine biodiversity and ecosystems.
- Strengthen the economic, social and cultural base of marine dependant regional/rural communities.

The *Sea Change* strategy was developed as an integral part of the government's *Strategy for Science, Technology and Innovation* (SSTI) and the Marine Institute as the lead implementation agency is working within SSTI policy and with government departments and agencies to deliver on the Strategy. The *Sea Change Strategy* sets out a comprehensive suite of integrated research measures and supporting programmes, each with specific objectives and targets (*Sea Change* Part II[1]).

The Marine Institute in its co-ordinating role has successfully developed complementary relationships with other funding bodies, the third-level sector and industry to develop novel partnerships and stimulate independent research and innovation initiatives to meet the objectives set out in the Strategy. This has facilitated a significant scale-up in the level of funded research supported by national and international programmes. An integral component of the implementation of *Sea Change* is performance monitoring and evaluation, including tracking and reporting on outcomes. As part of these reporting requirements, the Marine Institute's Sea Change Management Unit publishes on an annual basis the Sea Change Annual Progress Report, the second of which is presented here.

Yvonne Shields
Director,
Strategic Planning & Development Services/Sea Change

[1] Sea Change (2007-2013) Part II: Marine Foresight Exercise for Ireland.

Executive Summary

An estimated €100 million has been committed to marine R&D projects during the first two years of the implementation of the Sea Change Strategy:

- **48%** of which comes from **Marine Institute managed NDP** funds;
- **39%** from other **national funding bodies**; and
- **13%** from **international funding** sources.

In addition to the approval of a suite of new R&D projects in 2008—targeted primarily at the fisheries and aquaculture sectors—the Marine Institute, under the auspices of *Sea Change,* supported a range of new R&D programme initiatives aimed at stimulating improvements in the competitiveness of marine firms and the creation of new marine related commercial opportunities.

- Initiatives included an assessment of innovation needs of firms in Ireland's **seaweed** sector, led by the Marine Institute in collaboration with BIM, Enterprise Ireland and Údarás na Gaeltachta. This resulted in the development of an industry-driven research agenda for the seaweed sector resulting in a call for proposals by Enterprise Ireland in December 2008 under their Industry-Led Research Programme.

- Three new national programmes in Marine Biotechnology, Advanced Technology Research and Ocean Energy gained momentum.

    - The **National Marine Biotechnology Programme** included the establishment of a Marine Biodiscovery Laboratory and the hosting of the 1st Annual Irish Marine Biodiscovery Researchers' Workshop. Initial steps have been taken to strengthen links and create new synergies across a number of marine biotechnology initiatives e.g. Marine Functional Food and the Seaweed Industry-Led Research Programmes.
    - The Marine Institute continued to work closely alongside SEI colleagues supporting the development of **Renewable Ocean Energy**.
    - 2008 also saw significant progress on the **SmartBay project**, which leveraged a major R&D investment by IBM to establish a Centre for Water Management and Monitoring in Ireland initially employing 18 researchers.
    - Activity in support of Policy Research included strengthening research activity associated with the **marine environment** and the implementation of EU Directives in collaboration with EPA and NPWS, advancement of the **Marine Climate Change** Research Programme and the establishment of a Centre of Excellence in **Marine Socio-Economic** Research by NUIG and Teagasc.

Active participation by a range of stakeholders in the private and public sectors is a key element in the delivery and implementation of *Sea Change*. In 2008, the Marine Food R&D Advisory Group met twice, and meetings were held by the Marine Biodiscovery Advisory Group, Climate Change Advisory Group, and the Ocean Energy Research Forum. A meeting of the Sea Change High-Level Steering Group was held in November 2008 (attended by 42 representatives across 33 organisations – from the public and private sector). Other activities aimed at enhancing co-operation and collaboration included participation in a wide range of

national working groups (e.g. National Food Research Advisory Group, National Functional Food Forum, HERG Capacity Working Group (WG), IUA National Research Platform WG, IDA Environmental Technologies Initiative, ocean energy research and industry forums and various agency, government department and international R&D working groups).

1 Introduction

In 2008, activity associated with the implementation of *Sea Change* consisted of building on the significant achievements of 2007 (as outlined in the *2007 Sea Change Annual Progress Report*[2]). Specifically, the focus of Sea Change activity by the Marine Institute has been on:

- **Additional investment**, aimed at building on past achievements and addressing research and capacity gaps;
- **Managing research programmes and projects**;
- **Strengthening engagement with stakeholders**; and
- **Stimulating and supporting participation in international competitive research** programmes.

This report provides an update and summary on the key activities in 2008 under each of these activities.

2 Marine R&D Funds Committed in 2008

Marine Research Investment

Following on from a significant level of investment of €73.2m committed towards marine R&D in 2007[3], an additional €26m was committed in 2008 from national and international sources; bringing the total investment committed to the end of 2008 to €99.2m (Table 1 & Figure 1).

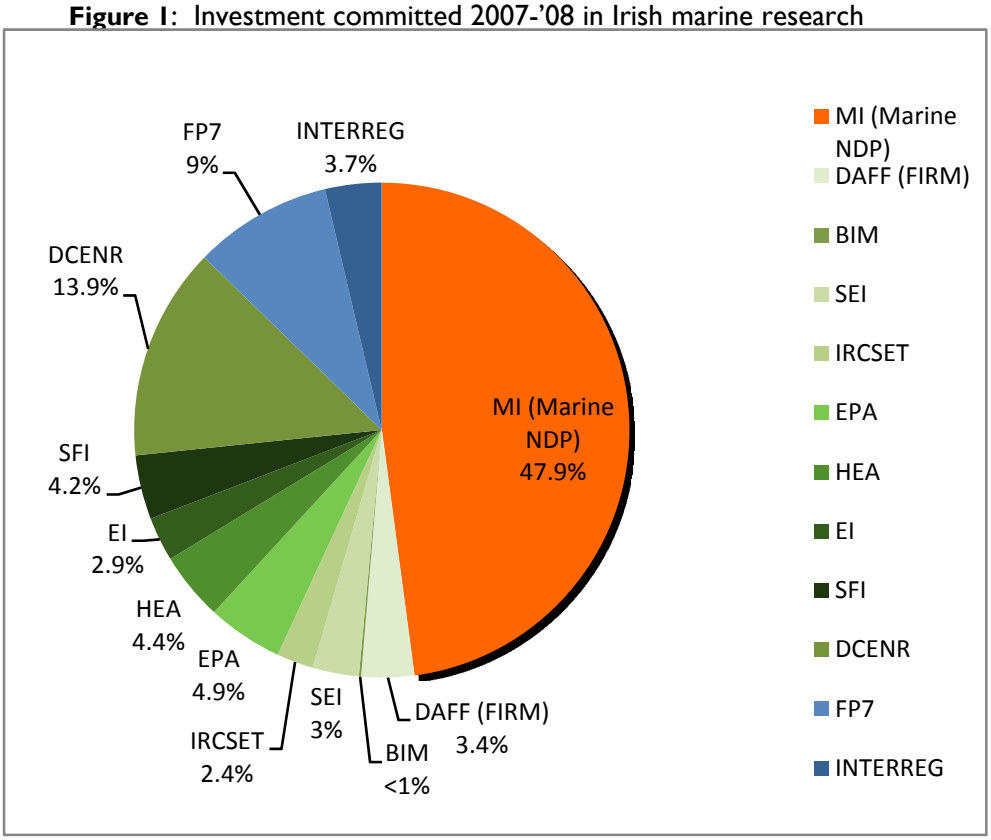
Investment over the period 2007-2008 came from a variety of competitive funding programmes:

- 48% from Marine Institute managed NDP funds;
- 39% from other national funding bodies; and
- 13% from international funding sources

[2] Sea Change Annual Progress Report 2007, Marine Institute

[3] The 2007 Sea Change Annual Report reported an investment of €65.4m in 2007. Additional 2007 investments identified during 2008 amount to €7.8m.

Figure 1: Investment committed 2007-'08 in Irish marine research



As in 2007, **new investment commitments in 2008** have come from a range of national and international funding programmes, principally:

1. **Marine Institute (€3.9m) - NDP Marine Research Sub-Programme**:
    a. New investment committed in 2008 focused on a targeted suite of projects that address specific objectives within the fisheries resources, aquaculture, environmental technology and biotechnology research programmes.
2. **FP7 and INTERREG IV (€7.5m)** - see Section 6.
3. **HEA (€2.9m)** – new investment commitments by the HEA included:
    a. €2.2m for a range of projects (including fisheries resources, marine biotechnology and marine environment) within the Institutes of Technology under the Technological Sector Research scheme (TSR STRAND I & III); and
    b. The provision of €700k to jointly fund the 2008 access to ship-time programme, providing access to the national research vessels for training programmes and research surveys (see Box 1).
4. **EPA (€1.12m)** – awards for marine-related projects were made under the STRIVE programme in the area of marine pollution impacts (viruses and metallic nanoparticles), sensor technology and climate change.
5. **IRCSET (€1m)** – in 2008 IRCSET funded 13 PhD Scholarships and 1 Post-Doc Fellowship in marine topics, notably renewable ocean energy and marine environment and ecosystems.

6. **SEI (€3m)** – SEI announced an investment of €3m in 2008 for ocean energy research initiatives, as part of an overall investment package of €26m over three years, through the Sustainable Energy Sub-Programme of the NDP. Further detail is provided in Section 5.

A list of marine-related R&D projects funded in 2008, from both national and international sources, is provided in Appendix I.

Table 1 details the **sources and level of investment** committed in marine R&D for the period 2007 and 2008 (through Marine Institute managed funding schemes, other national funding schemes and EU funding).

Box 1: National Government Investment in Science, Technology & Innovation

Exchequer investment in marine-related research comes via a range of sub-programmes within the Science, Technology & Innovation Programme of the NDP 2007-2013:

- **Marine Research Sub-Programme**—managed by the Marine Institute: funding is awarded on a competitive basis for public good 'applied' marine related R&D in line with the objectives set out in *Sea Change* (fisheries, aquaculture, environment, health, technology, economics, biotechnology, resource mapping etc.).
- **Agri-Food Research Sub-Programme**—principally the FIRM programme, managed by DAFF: funding is awarded on a competitive basis for public good research ('basic through to pre-competitive') in areas related to agriculture (food, environment, biodiversity, health, technology, economics, policy, energy etc.).
- **World-Class STI Sub-Programme**
  - Programme for Research in Third-Level Institutions (PRTLI) managed by the Higher Education Authority: funds Higher Education Institutions across a number of disciplines (e.g. marine, environment, transport, biotechnology, ICT, energy etc.), with particular focus on funding early stage researchers, education & training and HEI infrastructure.
  - Science Foundation Ireland provides funding for basic research to academic researchers and research teams in the following broad areas: biotechnology and life sciences , ICT and energy;
  - Research Councils (e.g. IRCSET): primarily fund early stage researchers i.e. through their PhD and Postdoctoral Programmes. The projects are bottom up (i.e. the research topic is defined by the applicant).
- **Energy Research Sub-Programme**—Sustainable Energy Ireland research funding aimed at stimulating the development and deployment of renewable energy technology; and
- **Enterprise STI Sub-Programme**—managed by Enterprise Ireland, funds applied research, commercialisation, technology & innovation aimed at developing indigenous companies across a range of industry sectors.
- **Environmental Research Sub-Programme**—Funding managed by Environmental Protection Agency via the STRIVE programme for R&D projects, PhD and Post-Doctoral awards and across of a wide range of environmental disciplines and sectors.
- **Geosciences Sub-Programme**—Managed by Department of Communications, Energy and Natural Resources: Investment in national priorities including energy, marine (including seabed & resource mapping), environment and transport.

Table 1: Sources of Funds and Focus of Investment Committed (2007-'08).

	Sources of Funds	Focus of Investment	Year (€000s)		Total (€000s)	%
			2007	2008		
Marine Institute managed Funding (NDP)	Marine Research Sub-Programme NDP	• Research Projects *Fisheries, aquaculture, shipping, seaweed, marine environment, knowledge & info mgt, climate change, marine biotech,* • Industry-Led Call *Ocean energy, marine functional foods/seaweed,* • Capacity Building (new research teams, Post-Docs & PhDs) *Fisheries/ecosystems, climate change, biodiscovery, marine functional foods, technology, socio-economics* • Research Infrastructure • Access to Ship-time: Training and Research Surveys • Networking Fund	43,560	3,944	**47,504**	**47.9%**
	Sub-Total		*43,560*	*3,944*	***47,504***	***47.9%***
Other National Funding Schemes	DAFF (FIRM)	• Research Projects & Capacity Building *Marine Food (Functional Foods, biotechnology)* Joint funding with MI (funds managed by the MI)	2,600	812	**3,412**	**3.4%**
	BIM	• Research Projects *Shellfish culture environment, Aquaculture production*	140	0	**140**	**0.1%**
	SEI	• Infrastructure Development & Test Facilities *Renewable Ocean Energy*	0	3,000	**3,000**	**3.0%**
	IRCSET	• Capacity Building (Post-Docs & PhDs) *Climate change, ocean energy, marine technology, seaweed, fisheries, marine environment, aquaculture, seafood processing, seaweed, ocean energy, marine environment, climate change* • ESF – EUROCORES Projects (Deep Sea research in the areas of – Marine Environment and Fisheries)	1,382	1,002	**2,384**	**2.4%**
	EPA (STRIVE)	• Capacity Building (PI, Post-Doc & PhD) & Research Projects *Marine technology, marine environment/biodiversity, fisheries, climate change*	3,779	1,118	**4,897**	**4.9%**
	HEA	• Joint funding with MI of Ship-time Programme (€700k-2008) *Technological Sector Research Scheme Research Projects* • Capacity Building / Research Equipment *Aquaculture, fisheries, seafood processing, seaweed, marine technology, marine biotech, marine environment*	1,463	2,947	**4,410**	**4.4%**
	Enterprise Ireland	• Research Projects & Equipment Grants *(Seafood processing, marine biotech)* • Industry Funding (e.g. RTI, R&D, commercialisation) *Seafood processing, marine manufacturing, boat building/design. marine technology*	2,037	822	**2,859**	**2.9%**
	SFI	• Research Frontiers Programme Research Projects: *Marine environment,* • Research Capacity Awards (Post-Docs & PhDs), Parsons Energy Awards in *renewable ocean energy* – (formally managed by DCENR)	*3,646*	*515*	***4,161***	**4.2%**
	DCENR/GSI (including INFOMAR)	• Griffith Capacity Building Awards (Post-Doc & PhD) *Offshore Oil & Gas/Knowledge & Information Management/Seabed & Resource Mapping* (€5.5m '07) • INFOMAR research project funding (€262k '08) • INFOMAR Programme Costs (€8m '07-'08)	9,541	4,262	**13,803**	**13.9%**
	Sub-Total		*24,588*	*14,478*	***39,066***	***39.4%***
EU	FP7	• Research Projects *Aquaculture, fisheries, marine environment, climate change, shipping, ocean energy,*	5,074	3,883	**8,957**	**9.0%**
	INTERREG	• Research Projects *Aquaculture, marine environment*	0	3,657	**3,657**	**3.7%**
	Sub-Total		*5,074*	*7,540*	***12,614***	***12.7%***
	TOTAL		**73,222**	**25,962**	**99,184**	**100%**

Focus of Investment

A summary of the **focus of the investment** committed to marine R&D related activities (2007 & 2008) is provided in **Table 2.**

In 2008, investment was particularly strong in a number of areas that offer new potential—e.g. seaweed (notably EU funded projects on marine biofuels) and ocean energy (SEI commitments). Other areas with notable new commitments in 2008 were marine environment (EU funding) and seabed and resource mapping (continued investment in the INFOMAR programme). Marine food research (fisheries resources, aquaculture and functional foods) also benefited from continued investment during 2008. Finally, investment in the marine technology and biotechnology programmes will further strengthen national capabilities in these emerging areas, which offer considerable global market potential/opportunities.

Table 2: Investment committed in line with *Sea Change* Research Themes (2007-'08).

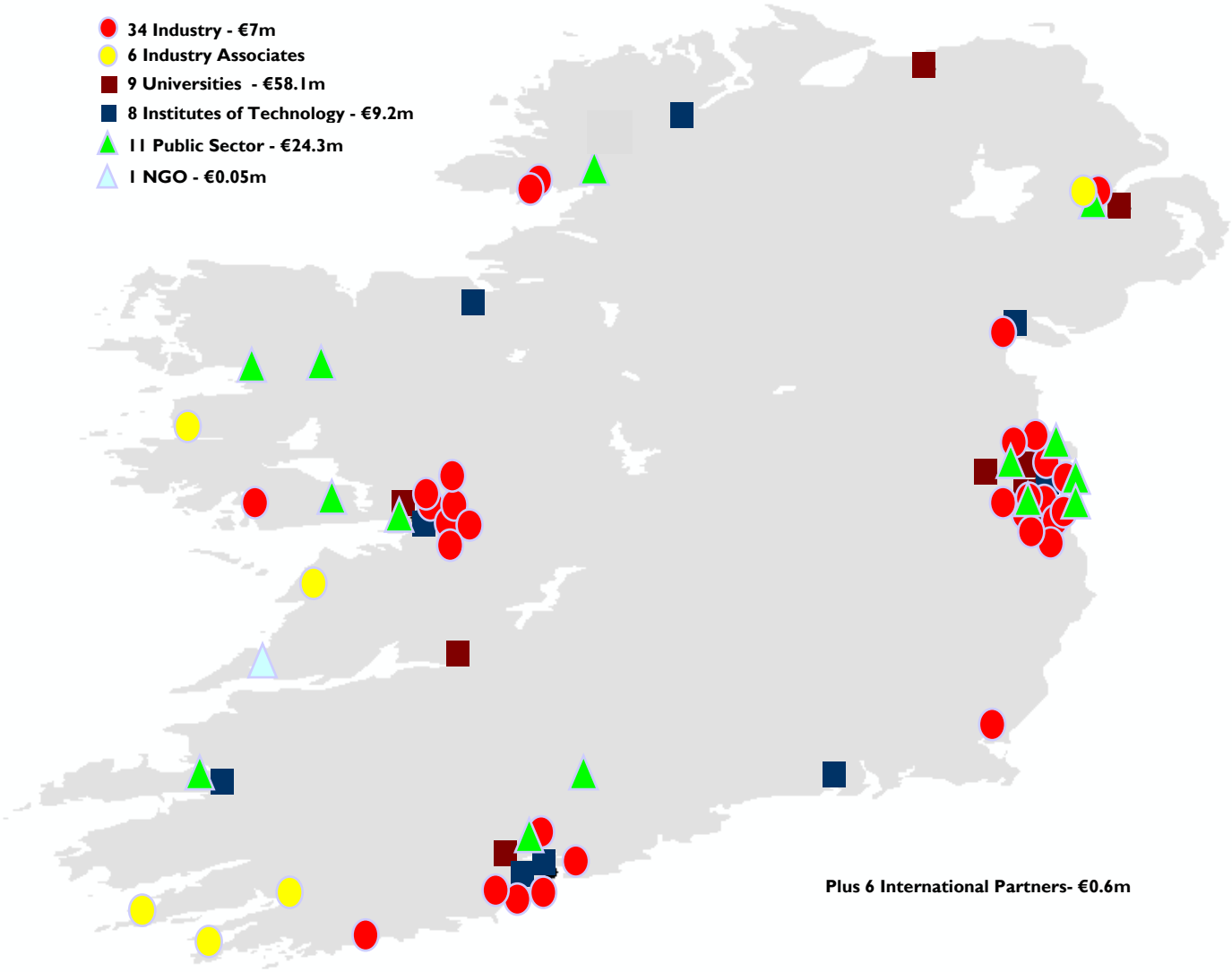
Sea Change Research Measure	Sea Change Research Programme	€000's			% 2007-'08
		2007	2008	Total	
Industry	Fisheries Resources	10,964	1,503	**12,467**	12.6%
	Aquaculture	5,267	2,580	**7,847**	7.9%
	Seafood Processing	967	72	**1,039**	1.0%
	Seaweed	1,782	2,870	**4,652**	4.7%
	Shipping	869	848	**1,717**	1.7%
	Offshore Oil & Gas	1,545	0	**1,545**	1.6%
Discovery	Marine Technology	3,295	1,046	**4,246**	4.4%
	Biodiscovery/Biotechnology	7,983	1,743	**9,821**	9.8%
	Renewable Ocean Energy	5,397	6,764	**9,161**	9.2%
	Marine Functional Foods	5,300	489	**5,789**	5.8%
Policy Support	Marine Environment/Ecosystems	4,606	4,078	**8,684**	8.8%
	Marine Climate Change	4,571	749	**5,320**	5.4%
	Knowledge & Information Management	2,580	95	**2,675**	2.7%
	Socio-Economic & Legal Research	2,099	5	**2,104**	2.1%
Infrastructure	Seabed & Resource Mapping	8,302	4,262	**12,564**	12.7%
	Research Vessel – Ship-time	1,453	1,216	**2,669**	2.7%
	Research Infrastructure	6,190	580	**6,770**	6.8%
Innovation	Networking	53	62	**115**	0.1%
Total Funding		**73,222**	**25,962**	**99,184**	***100%***

Research Capacity and Knowledge Generation

- In 2007, 81 new research positions (PIs and Post-Docs) and 76 new PhD scholarships were created. 2008 commitments have further strengthened this capacity building, bringing the numbers to over 98 new research positions and 99 PhD scholarships funded via the various sources.[4]

[4] This figure is preliminary. Further interaction with a number of funding agencies to determine exact numbers is ongoing.

Figure 2: Spread of investment committed 2007-'08 in Irish marine research



3 Marine Research Managed by the Marine Institute in 2008

In 2008, research projects approved by the Marine Institute were aimed at building on past achievements and addressing targeted research and capacity gaps. New project approvals included:

- €3.94m for targeted projects and research programme management;
- Investment in the provision of ship-time[5]; and
- Ongoing investment in priority national research infrastructure[6].

Details of projects are provided below.

Targeted Research Project Investment

Project approvals under the Marine Research Sub-programme of the NDP during 2008 amounted to €3.94m and were targeted at a number of specific initiatives:

- A targeted suite of **five projects** (3-4 years in duration) aimed at addressing specific objectives within the **Fisheries Resources** and **Aquaculture** Research Programmes of Sea Change. The grant-aid (€2.24m) is spread across a total of 15 organisations—including industry, public and higher education sector partners—and includes support for six PhD and two Post-Doctoral research positions.
- 48 **Networking Awards** valued at €61,832
    - International Workshops/Conferences (€24,000)
    - Mobility/Training Grants (€8,709)
    - 31 Travel Grants (€25,173)
    - Other networking Initiatives (€3,950).
- The Marine Institute entered into the second phase of a **strategic collaboration** with the **Environmental Protection Agency** aimed at fostering national RTDI capacity in the development of **advanced technologies for marine environmental monitoring**. The initial activity within this collaboration consisted of joint funding of a project aimed at development/deployment of water quality sensors and sensor communications.
- €1.37m in Grant-aid was committed to support the national programmes in **Marine Biotechnology** and **Advanced Marine Technology**. This investment will target interactions between researchers and industry and aims to add value, through securing additional funding, to the initial investments.
- Contracts totalling €110,000 were awarded to two commercial fishing vessel operators to undertake **surveys** in support of a **fisheries** project aimed at assessing the biomass of feeding aggregations of herring within the Malin Shelf stock complex.

[5] In 2008, ship-time grant-aid totalling €1,397k was awarded. Of this, €697k had been included in the 2007 commitments. The balance, €700k, was secured through joint funding by HEA and is included in 2008 figures.

[6] Just short of €6m was committed (and reported in 2007 Sea Change Annual Report) in 2007. Expenditure was equally spread between 2007 and 2008.

Acquisition of Research Infrastructure

A significant programme of investment in priority research infrastructure, begun in 2007, was completed in 2008. During 2008 a total of €1.55m was committed, bringing the total amount invested to just under €5.97m. This investment is funded through the Marine Research Sub-Programme of the NDP, with 40% co-funding from the European Regional Development Fund.

The most significant investment was the purchase of a deepwater (3,000m) Remotely Operated Vehicle (ROV). The ROV is primarily designed to operate from the RV *Celtic Explorer*, but is readily capable of mobilization from a range of suitable vessels, if required. It will facilitate expansion in the level of deepwater research undertaken by Irish researchers and enhance Irish participation in large international deepwater programmes/initiatives. The ROV's first scientific mission is scheduled for mid-2009. This mission will contribute significantly to a large-scale EU-funded (FP7) research programme, led by researchers in NUIG, which aims to assess the interaction between deepwater corals, fish and fisheries, in order to develop monitoring and predictive modelling tools for ecosystem-based management. Other missions planned in 2009 include a programme, to be carried out by the National Parks and Wildlife Service (DoEHLG), aimed at identifying offshore Special Areas of Conservation (SACs). The ROV will also be made available as a national resource to state agencies in emergency situations such as casualty investigation, wreck surveys or salvage.

All of the infrastructure items acquired are specifically linked to achieving priorities set out in *Sea Change* and supporting a number of key funded projects/programmes—initially in the following areas; Climate Change, Seabed & Resource Mapping, Fisheries Resources, Marine Biodiscovery, Marine Technology and Renewable Ocean Energy. During 2008, activity also focused on commissioning and deployment of the infrastructure (see Box 2).

Box 2: Integrating Research Infrastructure

During 2008, considerable resources have been focused on commissioning and deploying significant research infrastructure. Key amongst these is a suite of coastal and marine observation and monitoring equipment that will greatly improve the ability to study the transient and unpredictable processes taking place in Ireland's coastal waters and the deep ocean; assess the extent to which Ireland's climate is changing; support SmartBay and distinguish naturally occurring changes in the system from those that can be attributed to human activities. The equipment deployed to date includes:

- Tide gauge instrumentation and inshore and offshore oceanographic buoys that provide vital real-time data for weather forecasting and coastal flood prediction and act as long-term climatological monitoring stations. The inshore data buoys are a critical element in phase I of *SmartBay*.
- Profiling Argo Floats—these autonomous instruments float at a depth of 1,000m in the ocean and rise to the surface every ten days generating a profile of ocean temperature and salinity. The data collected forms part of Ireland's contribution to the Global Climate Observing System.
- An unmanned glider vehicle, with a range of 1,500km, equipped with sensors that measure ocean temperature, salinity, chlorophyll and oxygen. The data gathered are relayed to shore using satellite communications.
- A novel Automatic Water Quality Monitoring Station deployed at a long-term sentinel site in Lough Furnace (Co. Mayo), supporting an array of meteorological and oceanographic sensors.

The substantial data streams from this suite of infrastructure feeds into the work of the Institute's Marine Climate Change Programme. This programme, being carried out by a team of researchers in the Marine Institute and three HEI's, is undertaking a preliminary two-year programme of research relating to ocean mediated climate change. Historical datasets are being combined with new streams of data to provide future scenario models and to examine the impacts of climate change on marine ecosystems and species, including commercial fish species. Such an approach can contribute to future efforts to develop area/ecosystem based management plans. Key outputs from the programme will include an Ocean Climate Status Report for Ireland and a National Ocean Climate Change Research Plan (both due for publication in 2009).

Access to Research Infrastructure

2008 marked the third year in which the Marine Institute awarded grant-aid to provide access to researchers to the national research vessels (R.V. *Celtic Explorer* and R.V. *Celtic Voyager*) and associated equipment. Grant-aid approvals in ship-time in 2008 (see Table 3) doubled, to €1.4m, compared with 2007. This was enabled by the provision of match funding for the scheme by the HEA.

Table 3: Summary of 2008 grant-aid under the National Ship-Time Access Programme

Activity	Amount Funded	No. of Beneficiary Institutions	No. of Scientists/ Students	No. of Scientist/ Student Days	No. of Survey Days
Research	€980	5	67	1,059	82
Training	€417k	6	131	615	42
TOTAL	**€1,397k**	**7**	**198**	**1,674**	**124**

Note: In addition to the seven Irish (island of Ireland) institutions, five non-Irish HE institutions participated in research surveys as partners.

Box 3: Providing Access to World-Class Research Vessels

The ship-time access programme aims to expand existing marine research capabilities and build research potential. Grant-aid is awarded to support:

I. dedicated training programmes at sea, provided by higher education institutions; and
II. integrated research surveys of a multidisciplinary nature, carried out by higher education institutions and R&D focused organisations.

The benefits of the provision of funding for ship-time include:

- Significantly improving the competitiveness of Irish researchers in applying for EU funding, putting Irish researchers on an equal footing with their EU counterparts, who already receive financial supports to access ship-time, and;
- Maximising the value for money and return on investment by the state in national infrastructure and the utilisation of world-class infrastructure on strategic national projects consistent with the objectives of *Sea Change*; and
- Provision of training to undergraduate and postgraduate students on world-class research vessels.

4 Managing Research Programmes and Projects

Within the overall context of achieving the objectives and targets set out in *Sea Change*, the Sea Change Management Unit (SCMU) undertakes activities associated with the development, co-ordination, management, technical and scientific monitoring and delivery of research programmes and projects.

Project Management

Significant activity in 2008 focused on ensuring the smooth and efficient start-up and running of initiatives administered by the Marine Institute. This activity has included:

- Implementing a *Project Management Framework* and reporting structure to ensure that funded projects/initiatives address their overall objectives and meet their deliverables in a timely manner and disseminate and utilise interim and final outputs to the maximum possible benefit (e.g. commercialisation, policy development, new business opportunities).
- Hands-on interaction to assist in project start-up; including the provision of assistance in the definition of work programmes and assistance in recruitment of high-calibre researchers;
- Commissioning and deployment of a suite of research infrastructure (See above);
- Ongoing input into projects through participation in project steering/advisory meetings; and
- Implementation of a Research Information Management System to support the management and administration of funded projects; and the collation, monitoring and reporting of data on the performance indicators and high-level impacts for Sea Change. This system will be rolled out on a phased basis during 2009, focusing initially on providing current Marine Institute funded projects with the facility to submit technical and financial reports on-line to allow better tracking of project progress and outputs.

In addition to managing the substantial project portfolio funded since 2007, SCMU are active in ensuring projects funded under the Marine RTDI Measure of the 2000-'06 NDP maximise research outputs. This includes working with researchers in the HE sector and industry to develop the commercialisation path and secure additional funds for proof-of-concept/ commercialisation phases; and linking researchers with relevant industry partners.

Programme Management

Programme management activity in 2008 focused on and included:

- Substantial formal and informal interaction with stakeholders, including interaction via the Sea Change Advisory Groups and the High-Level Steering Group(see Section 4);
- Developing collaborative initiatives to maximise funding opportunities from a wide range of public and private sources;
- Participation in a wide range of national working groups (e.g. National Food Research Advisory Group, National Functional Food Forum, HERG Capacity WG, IUA National

Research Platform WG, IDA Environmental Technologies Initiative, ocean energy research and industry forums and various agency, government department and international working groups); and

- Participation in EU collaborative Working Groups to develop marine research priorities for funding under FP7.

5 Co-operation with Other Agencies and Industry Stakeholders

Active participation by a range of stakeholders in the private and public sectors is a key element in the delivery of *Sea Change*.

Engagement with **industry** aims to secure active participation in *Sea Change*; assess the on-going relevance of research to commercial and market needs; promote and facilitate greater linkages between the target industry sectors and the HE sector; and support the development of existing and new research capabilities and competencies that will benefit industry.

Engagement with **public sector** (e.g. government departments, development agencies and funding bodies) seeks to create an awareness of collaborative opportunities to pool experience, expertise and funding to meet shared objectives; progress research initiatives; exploit industrial and commercial development opportunities; stimulate innovation and commercialisation of research; and ensure funding priorities are aligned with national and international strategic objectives/policies.

Stakeholder interaction is most evident via the Sea Change implementation framework (High-Level Steering Group and Advisory Groups), which draws on expertise from across the spectrum. In addition, significant additional formal and informal interaction has taken place in 2008. Some key achievements are outlined below.

Fisheries, Aquaculture, Seafood & Seaweed

In 2008, approximately €7m of research projects in fisheries, aquaculture, seafood processing and seaweed were approved from a variety of national and international funding sources[7]. Table 4 provides a summary of research investment committed in 2007 and 2008 in fisheries, aquaculture, seafood and seaweed.

Table 4: Summary of research investment committed in 2007 and 2008 in fisheries, aquaculture, seafood and seaweed

Sea Change Research Programme	€000s		%
	2007	2008	2007-'08
Fisheries Resources	10,964	1,503	12.6%
Aquaculture	5,267	2,580	7.9%
Seafood Processing	967	72	1.0%
Seaweed	1,782	2,870	4.7%
Totals	**18,980**	**7,025**	**26.2%**

[7] Project details and funding sources are provided in Appendix 1

Fisheries Resources

The vision for the fishing industry set out in *Sea Change* is of "***an economically viable fishing industry***" with a "***well managed and sustainably exploited resource base***". In tandem with *Sea Change*, the report of the Seafood Industry Strategy Review Group (*Cawley Report*[8]) set out a vision for "***a sustainable, profitable, competitive and market-focused seafood industry making the maximum long-term economic and social contribution to coastal communities and Ireland as a whole***".

Key to the achievement of these visions is rebuilding fish stocks using clear, reliable and impartial marine science and increased industry interaction/participation in the scientific advisory process. Significant stakeholder participation is ongoing via:

- *Direct industry participation in:*
  - *i. Research projects*
    - The Federation of Irish Fishermen and BIM are partnering with NUIG in a project aimed at capturing the 'tacit' knowledge in the fishing industry for use in the scientific assessment, advisory and fisheries management process. It is widely accepted that more frequent use of fishers as data collectors and better use of "local" or "fishers" or "traditional" knowledge will improve this process. This approach is in line with the European Commission's vision for fisheries management, embodied in the ongoing review process for the Common Fisheries Policy.
    - The Beaufort *Ecosystem Approach to Fisheries Management* project is developing strong links to industry, which are seen as key to the future development of management plans that incorporate input from all stakeholders.
  - *ii. The definition of research programmes/projects*
    - The Marine Food Advisory Group provides an ideal forum for two-way communication and participation by stakeholders in the fishing industry. Membership of the group includes representatives of fishermen's organisations and BIM. Updates by researchers at this forum allows for direct feedback from the industry.
  - *iii. The fisheries management process*
    - The **Irish Fisheries Science Research Partnership**, established in 2008 by Mr. Tony Killeen T.D., Minister of State at the Department of Agriculture, Fisheries and Food, provides a forum where fishermen, and fisheries scientists can work together towards a sustainable fishing industry by developing plans that will lead to rebuilding of all stocks.

- *Ensuring Sea Change remains aligned with relevant national strategic policies and objectives*

[8] STEERING A NEW COURSE-Strategy for a Restructured, Sustainable and Profitable Irish Seafood Industry 2007-2013

Ensuring funded projects address a number of the core themes/ recommendations within the *Cawley Report e.g.*:

- *Core Theme 2; Market-Led Innovation* – marine functional foods. seaweed taste & flavouring;
- *Core Theme 5: Fisheries Management* – research aimed at increasing knowledge of fish stocks, improving management advice, rebuilding depleted fish stocks; and
- *Core Theme 8: Marine Environment & Conservation* – reducing discards, ecosystem approach to fisheries management.

Aquaculture

Ireland's finfish aquaculture industry faces a number of challenges, including loss of profitability due to mortalities caused by diseases and the need to diversify into new species. To address these challenges and build a sustainable industry, the Marine Institute has worked closely with industry and other stakeholders to define and implement a suite of research projects that comprise academic, industry and public sector partners. These include:

- *AquaPlan*
  The project will develop scientifically proven measures for the management and mitigation of infectious diseases in finfish aquaculture in Ireland. The project will take account of the impact infectious diseases have on the industry in terms of losses due to poor growth and high mortalities, whilst developing a comprehensive strategy for the management of health issues in the Irish aquaculture industry. Particular emphasis will be placed on preventative measures, early warning systems, reporting and training.
- Gill *Pathologies*
  This project will develop scientifically proven measures for the management and mitigation of infectious diseases in finfish aquaculture in Ireland and support the effective implementation of EU Fish Health Directive 2006/88.
- *Cod Broodstock*
  A consortium of partners led by NUIG—and including UCC, BIM, the Irish Seafood Producers Group and Trosc Teo—have been awarded €4.1m over seven years to develop a cod broodstock programme and establish an indigenous supply of quality eggs/juveniles in support of the emerging cod farming industry.

Seaweed

In April 2008, 15 Irish seaweed firms, Enterprise Ireland, BIM and Údarás na Gaeltachta participated in a Marine Institute-led workshop designed to explore gaps in knowledge that inhibit the industry's development and to define and prioritise specific research needs. The firms worked collaboratively to submit expressions of interest to Enterprise Ireland. Following a successful review by EI the firms were asked to submit a final research plan. This plan formed the basis of a competitive call for research proposals from public research institutes, under the EI Industry-Led Research Programme (ILRP) scheme, to carry out a defined programme of work that addresses the identified needs of the industry; namely to:

- Collate current knowledge on key seaweed species, composition and processing;
- Provide a chemical and biochemical analysis of named species of seaweed and examine the seasonal, geographic and environmental influences on the composition and quality of bioactive compounds;
- Understand the impact of various extraction processes on the composition and yield of bioactive compounds from seaweed; and
- Provide chemical analysis of substances or compounds that may accumulate in seaweeds and affect the food safety of seaweeds and their resultant extracts.

The call was launched in late 2008 with the application, evaluation and award process due to take place during 2009.

Advanced Marine Technologies

The Marine Technology Research programme of *Sea Change* aims to create a multi-disciplinary industry-oriented research grouping (in the field of sensors, intelligent systems and sensor platforms) and focused capability in the application of ICT to the marine sector in order to deliver innovative technology solutions to targeted marine sectors (aquaculture, seafood processing, environmental monitoring and ocean energy). A significant requirement in support of this is the delivery of SmartBay (Box 4), which has been widely endorsed as a valuable platform to catalyse and accelerate Irish ambitions in the field of environmental technology and position Ireland as a major player in the emerging global market for environmental technologies. SmartBay is a specific objective of the Governments' SSTI.

During 2008, the Marine Institute has worked closely with the EPA to build on a collaboration established during the period 2005-2007, to develop national RTDI capacity in the area of **water quality monitoring**, particularly in respect of **new technologies** to support the implementation of the Water Framework Directive; new technologies to support the sustainable development of aquatic/marine resources; and support the creation of new industrial capabilities in water management and sensors technology. This partnership has now been strengthened by the active engagement of Enterprise Ireland and IDA.

In 2008, the Marine Institute continued to work with key stakeholders on the **SmartBay** Project. This included significant consultation with a range of stakeholders aimed at progressing investment for the infrastructure elements of SmartBay, as well as a number of R&D initiatives. The following summarises the main achievements:

- The SmartBay Pilot Project was initiated by the Marine Institute utilising funding from the ERDF Infrastructure Programme resulting in the installation of a number of wireless sensor nodes in Galway Bay during 2008.
- The Marine Institute's capacity in marine science, technology and data management has been a critical factor in the decision by IBM to create a leading Centre of Excellence (CoE) in Water Monitoring and Management specialising in marine, coastal and freshwater research in Ireland announced by the Minister for Finance in June 2008 with the creation of 18 jobs. The CoE will focus primarily on innovative research and services in monitoring, quality control, and management of fresh water, coastal and oceanic environments. This investment is seen as a significant strategic win for IBM Ireland and IDA Ireland and will enhance Ireland's reputation globally as a research and development location for emerging "Green Technology". A number of key projects being carried out within the CoE directly support the SmartBay initiative. These include:
    - Development of a SmartBay sensor-to-web information system and portal to provide enhanced visualisation and customizable display of the sensor readings and data collected and managed by the Marine Institute in the Galway Bay area;
    - Sensor research in association with researchers in the Higher Education (HE) sector;
    - Collaboration with an Irish SME to integrate marine weather forecasting services into the SmartBay web portal system; and
    - Collaboration with Ocean Energy researchers to develop advanced data visualisation and analysis tools for wave data analysis.
- An alliance with Intel Ireland will test the feasibility of *Wimax* wireless communications technology over water. Integration of this state-of-the-art ICT infrastructure into SmartBay would give Ireland a key advantage in the development of maritime mobile wireless broadband networks; providing a test site for advanced coastal observation and monitoring technologies; facilitating advanced sensor and sensor system technology research; and further advancing marine research and innovation capabilities.

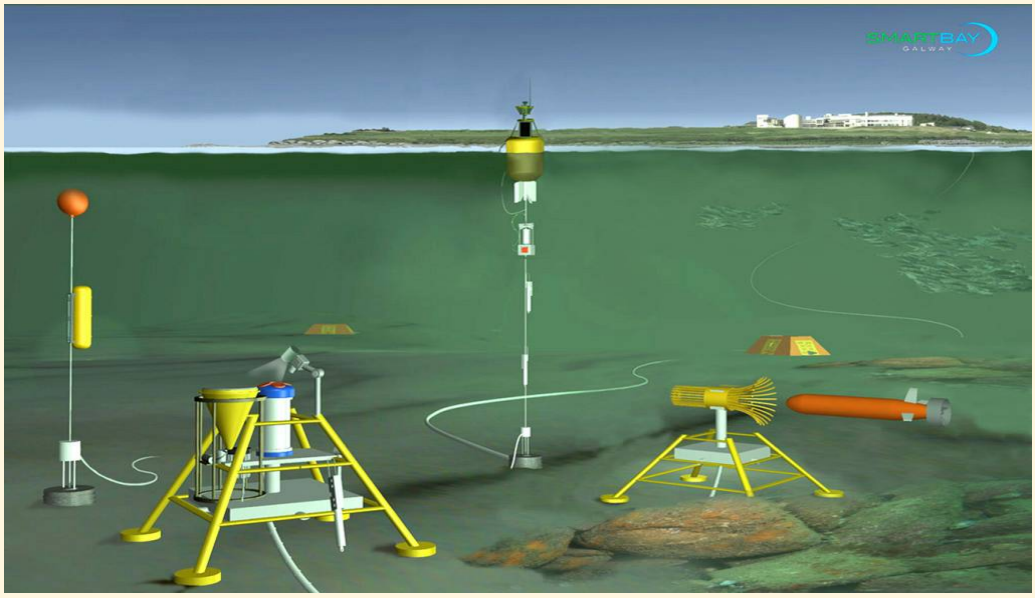
Box 4: SmartBay— A Marine Research, Test and Demonstration Infrastructure for Ireland.

The objective of **SmartBay** is to develop a networked deployment of a suite of emerging new technologies, including:

- A fibre-optic cable from shore to an underwater hub
- A variety of instrument nodes and sensor packages
- An instrumentation test site facility
- Deployment of moored and drifting buoys
- Navigation, communication and telemetry infrastructure
- Advanced data processing, integration and presentation tools.

Together, these are intended to provide a comprehensive set of tools and technologies that will be utilised in future customised solutions for the monitoring of important water bodies, on a global basis. SmartBay will be a unique, world-class infrastructure from which Ireland can create an indigenous cluster of research and industrial technology development and testing capabilities and activities to support the commercialisation of environmental technologies

The **SmartBay Pilot Project**, the deployment and operation of buoy mounted sensor arrays at key locations throughout the Bay, was progressed significantly in 2008. The SmartBay wireless sensor nodes transmit data using satellite, GSM, GPRS, VHF radio telemetry systems.



Renewable Ocean Energy

Over the last number of years the Marine Institute has worked closely with Sustainable Energy Ireland (SEI) to promote and develop Ireland's Ocean Energy sector. Key achievements prior to 2008 have included the publication of an Ocean Energy Strategy for Ireland, funding by the Marine Institute to develop significant ocean energy research capacity in UCC and the establishment of an inshore wave energy device test site (An Spideál, Co. Galway).

This close working relationship led to the establishment in 2008 of the Ocean Energy Development Unit (OEDU) within SEI, operating with the support and assistance of the Marine Institute. The Minister for Communications, Energy and Natural Resources announced a major programme of activity, grants and supports to develop ocean energy in Ireland, earmarking over €26 million for the sector over the next three years (2008-2010), under the Sustainable Energy Sub-Programme of the NDP, administered by SEI. This funding will include[9]:

1. The establishment of the Ocean Energy Development Unit (OEDU) as part of SEI;
2. Support for Ocean Test Facilities in UCC for the development and testing of early ocean energy devices;
3. The development of grid-connected wave energy test site (Co. Mayo) and further upgrading of the inshore wave energy device test site (Co. Galway);
4. Funding for an Ocean Energy Prototype Fund, to help developers make their devices commercial; and
5. The introduction of a new feed-in-tariff scheme for wave energy.

Initial commitments under this programme in 2008 amounted to €3m—€2.5m and €0.5m for items 2 and 3 (above), respectively.

Shipping & Maritime Transport

The shipping and maritime transport sector is the largest sub-sector of Ireland's marine economy. Developing an understanding of the role and potential of researchers to contribute to the sector's further development was a challenge set out in *Sea Change*. An extensive desk study, including a wide consultation with major stakeholders was initiated in 2008 to define a research agenda. A key element of the study was to secure direct inputs from industry and other stakeholders in defining research needs and in assessing research capabilities. In April, 2008 the Marine Institute/Irish Maritime Development Office organised an industry workshop (attended by 47 participants) to address four key questions:

- How do we build on existing capabilities?
- What are the key research themes?
- What mechanisms (partners, funding, networks) are appropriate for Ireland?
- What are the priorities and how do we set them?

Arising from the desk study and the outcomes of the consultation workshop the Marine Institute—via the Irish Maritime Development Office (IMDO)—aims, during 2009, to finalise a research agenda and examine funding options available.

[9] This represents the preliminary plan for the first tranche of investment. Further clarification will be provided once details are available.

6 Participation in International Competitive Research Programmes

The Government's Strategy for Science, Technology and Innovation (SSTI) targets substantial increases in the national 'take' from European research programmes (principally FP7) over the current cycle (2007-'13) compared to the previous funding period (2000-'06. *Sea Change* also targets a significant investment in marine research from European sources in order to add value to national investments. The Institute's EU desk actively stimulates and supports Irish participation in FP7 and INTERREG IV and collaborates closely with the *Sea Change* Management Unit with the aim of ensuring, where relevant, that appropriate links between EU and nationally funded projects are established.

In 2007, Irish marine researchers were awarded €5.1m in EU funding. In 2008, Irish researchers secured an additional €7.54m in grant-aid (See Table 5). This investment is spread across 37 projects that fall within ten of the 15 *Sea Change* Research Themes and the Infrastructure Supporting Programme. The performance of the marine research community in FP7 is strong, in relation to overall national performance[10]—with particular success in the Energy, Environment and Space programmes of FP.

The success of Irish marine researchers in attracting FP7 and INTERREG IV funding compares with a total of ~€23m awarded during the entire duration of the previous cycle (2000-2006). Two notable successes in FP7 include:

- **CoralFish** (Total Value €11.4m) - led by Dr Anthony Grehan at NUI, Galway, will investigate interactions between Atlantic deepwater corals and fisheries and develop methodologies for protection of endangered coral reef communities.
- **CORES** (Total Value €4.5m) - led by Dr Tony Lewis at UCC's Hydraulic and Maritime Research Centre (HMRC), will develop and refine technologies for generating economically viable electricity on prototype wave energy systems.

Table 5: Summary of EU Marine Research Projects with Irish Participation 2007 and 2008

EU Programme	Focus of Investment	€000's		Total €000's
		2007	2008	
FP7 Theme 2 – KBBE, Theme 5 – Energy, Theme 5 – Environment, Theme 7 – Transport, Theme 10 – Space	Aquaculture, fisheries, marine environment, climate change, shipping, renewable ocean energy	5,074	3,883	8,957
INTERREG IV Ireland-Wales; Northern Periphery Programme; Atlantic Area; Ireland, Northern Ireland, Scotland	Environment, fisheries, aquaculture, marine biotechnology. renewable ocean energy, shipping	-	3,657	3,657

* A full list of successful 2008 EU projects is provided in Appendix I.

[10] The total funding awarded to Irish researchers during the first two years of FP7 was €107m (Source: Enterprise Ireland, June 2009). Marine research performers accounted for 8.3% of this.

Box 5: European Marine Research Agenda and Sea Change

The EU Commission Communication "*A European Marine and Maritime Research Strategy*" was published on 3rd September 2008 and provides an important framework for European Marine and Maritime Research in the years ahead. The strategy, which represents one of the major pillars of the Integrated Maritime Policy for the European Union (October 2007), was recommended by many Member States (including Ireland) during the Green Paper consultation process and a priority of the European Marine and Maritime Research Communities (Aberdeen Declaration, June 2007).
The Research Strategy presents significant opportunities for Ireland to leverage matching EU Research Funds and carry out collaborative projects based on the significant investments already made and planned under the *Sea Change* Strategy.

During 2008, Marine Institute staff played a key role in number of fora, with the aim of defining future EU research priorities and ensuring Irish interests are well integrated in future research programmes, including:

- EU FEUFAR project to define future research needs for fisheries and aquaculture;
- EU collaborative Working Group on developing marine biotechnology research priorities for funding under FP7; and
- An EU/US think-tank on marine biotechnology.

Other activities included:

- the preparation of the Marine-Board –ESF and EuroGOOS European Marine Observation and Data Network Vision Document*; and
- the publication of a guide to European and Associated States S&T Policies, Marine Research Strategies and Marine Research Funding Programmes (a deliverable of the EU FP6 MarinERA Project).

* Presented to EU Fisheries & Maritime Affairs Commissioner Joe Borg in October 2008 at the French-EU Presidency BioMarine 2008 Forum in Marseille.

7 Measuring Performance

Sea Change identified a comprehensive set of input-output-impact indicators. In 2008, these indicators were reviewed and refined in conjunction with Department of Enterprise, Trade and Employment and linked to the national *Strategy for Science, Technology and Innovation* (SSTI) indicators, in order to facilitate the compilation of national statistics on the performance of the SSTI as a whole.

The indicators (Table 6) measure the contribution of *Sea Change* to the success of the SSTI and reflect its key objectives, under the following critical areas:

1. Significant increase in the numbers of people with advanced qualifications in science and engineering;
2. Enhanced contribution of research to economic and social development across all relevant areas of public policy including agriculture, health, environment and the marine and natural resources;
3. Transformational change in the quality and quantity of research undertaken by enterprise – both directly and in co-operation with third level institutions;
4. Increased output of economically relevant knowledge, know-how and patents;
5. Increased participation in international S&T co-operation and transnational research activity;
6. An established international profile for Ireland as a premier location for carrying out world class research and development; and
7. Greater coherence and exploitation of synergies to mutual advantage in the development of STI policy on the island of Ireland.

Indicators marked with * in Table 6 are those for which the Marine Institute report on for the Marine Research Sub-Programme within the framework of NDP reporting. These Marine Research Sub-Programme indicators were agreed in 2007 with the Department of Finance, via the Department of Agriculture, Fisheries and Food.

Table 6: *Sea Change* (including Marine Research Sub-Programme) Performance Indicators

Performance Indicator	SSTI / Sea Change	Marine Research Programme NDP '07-'13	
Human Capital/Research Capacity Indicators Significant increase in the numbers of people with advanced qualifications in science and engineering	**Progress to Date 2008**	**Target**	**Progress to Date 2008**
People			
No. of Principal Investigators Funded	6	-	6
No. of Researchers (PhD+) Funded	84	50	35
No. of Research Assistants Funded	-	-	-
No. of Technicians Funded	-	-	-
No. of PhD Scholarships	98	100	48
No. MSc Scholarships	-	-	-
No. Research Partnerships Funded	-	40	16
Increased Access to Specialist Infrastructure (Research Vessels)	-	400 Days	100 Days
Specialist Research Equipment Acquired	-	30	14
Economic/Socio-Economic & Regional Development Indicators Enhanced contribution of research to economic and social development across all relevant areas of public policy including agriculture, health, environment and the marine and natural resources	**Progress to Date 2008**	**Target**	**Progress to Date 2008**
R&D Investment in Regional Economies			
No. and Value of Projects Funded in BMW Region	-	48	12
% With SME Participation	-	40%	40%
Increase in the Value of the Marine Sector	-	-	-
Creation of New Marine Business Opportunities	-	-	-
Enterprise R&D Indicators Transformational change in the quality and quantity of research undertaken by enterprise – both directly and in co-operation with third level institutions	**Progress to Date 2008**	**Target**	**Progress to Date 2008**
No. Research Projects with SME Involvement			
No. Industry-Led	-	-	4
No. Public/Industry Research Collaborations		28	7
Increased R&D Intensity of Marine SME's			
No. SME's Performing Research Funded	-	58	16
% First Time Research Performers	-	30%	TBC
Innovation/Commercialisation Indicators Increased output of economically relevant knowledge, know-how and patents	**Progress to Date 2008**	**Target**	**Progress to Date 2008**
No. Patents Applied for	-	-	1
No. of Patents Granted	-	-	0

Performance Indicator	SSTI / Sea Change	Marine Research Programme NDP '07-'13	
No. Patents Generating Revenue	-	-	-
Number of Invention Disclosures Reported	-	-	-
New Methods/Standards/Services Developed and Implemented	-	-	-
All-Island and International Collaboration Indicators Increased participation in international S&T co-operation and transnational research activity	**Progress to Date**	**Target**	**Progress to Date**
North-South Research Collaboration No. North-South Research Collaborations Funded Shared Use of Research Infrastructure		8 -	8 -
Participation in EU Funding Programmes No. & Value EU Funded Projects with Irish Partners No. & Value EU Funded Projects led by Irish Partners No. Irish Researchers Participating in EU Funded Projects	€14.4m - -	- - -	- - -
Other International Collaboration No. International Partners in Nationally Funded Projects No. Irish Partners in International (non-EU) Projects	- -	- -	7 -
Research Recognition & Knowledge Generation/Dissemination Indicators An established international profile for Ireland as a premier location for carrying out world class research and development	**Progress to Date**	**Target**	**Progress to Date**
Publications in Refereed International Journals	-	170	10
Publications in Refereed International Volumes/Conference Proceedings	-	-	-
Other Publications (e.g. National Journals/Proceedings, Monographs)	-	-	-
Citations	-	-	-
Policy/Public Service Indicators Greater coherence and exploitation of synergies to mutual advantage in the development [implementation] of STI policy on the island of Ireland	**Progress to Date**	**Target**	**Progress to Date**
Level of Stakeholder Participation in Strategy Implementation/Review Process	-	-	-
No of Research Outputs Contributing to National and EU Policy Development	-	-	-

8 Future Agenda

The investment committed in marine R&D over the first two years of *Sea Change* has ensured that a strong platform and foundation are in place, to foster the potential for new marine-related commercial opportunities for Ireland. However, with global and national economic challenges ahead, it is critical that resource challenges are overcome and that investment in science and technology is maintained to ensure the vision, aims and objectives of Sea Change are met.

The following summarises the Sea Change Management Unit's key actions for 2009:

- Ongoing scientific and technical management of projects and programmes funded under the NDP Marine Research Sub-Programme ensuring:
  - deliverables are being met;
  - high quality scientific research is achieved;
  - value for money is achieved; and
  - commercial opportunities / IP are explored throughout duration of the projects.
- Maintain a high profile for marine research at national and international level
- Prioritise additional R&D investment needs
- Work with other agencies and industry to secure funds to address key gaps
- Build alliances between MI funded R&D projects and other R&D projects to maximise return on investment
- Develop new types of partnership that go beyond co-ordination to integrated action
- Create awareness of policy road blocks in areas of new opportunity
- Actively promote research results.

Appendix 1: Marine R&D Investment 2008

Marine Institute and Other Sources

NOTES:

1. The list of projects presented below is a preliminary one. Further data collection from a number of funding agencies is likely to increase the number of funded marine projects.
2. A number of projects included below were funded in late 2007 but were not previously included in the list of marine projects provided in the 2007 Sea Change Annual Progress Report.
3. In a small number of cases the grant-aid amount is approximate and the information provided is incomplete (e.g. project duration). Further interaction with the appropriate funding agencies will be required to complete/verify the data.
4. Grant-Aid Amounts
    a. The grant-aid amount in the tables is the amount verified at the time of writing and means the maximum grant-aid allocated to the project.
    b. In the case of EU (FP7 & INTERREG) projects the Grant-aid amount is the amount awarded to Irish partner(s) on a particular project at the project approval stage.
5. Green = MI (NDP Marine Research Sub-Programme) funded projects
   Blue = EU Funded projects
   Grey = Other Nationally funded projects

6. In the case of EU funded (FP7 and INTERREG) projects only Irish partners are listed. Where a project is led by a non-Irish institution the lead partner is listed.

Industry Research Measure

Seafood Processing

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	IRCSET (PhD Scholarship)	Trends and Trajectories of Ireland's Seafood Needs: Towards the Goal of Sustainability	€72,000	36 Months	University College Dublin *School of Biology and Environmental Science*	
2007	BIM	Long-term cold water storage of high valuable crustacean species		12 Months	National University of Ireland, Galway	
2007	Enterprise Ireland Applied Research Enhancement	Shelltec	€500,000		Galway-Mayo Institute of Technology	
2007	Enterprise Ireland (RTI/R&D)	Seafood Product Development (x2 Awards)	€466,574 (2 awards)		2 Industry Recipients	

Fisheries Resources

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute NDP Marine Research Sub-Programme (Project-Based Award)	The Establishment and Application of Protocols to Capture, Collate and Integrate the Tacit Knowledge in the Fishing Industry for Use in the Scientific Assessment, Advisory and Fisheries Management Process	€332,152	36 Months	National University of Ireland, Galway *Political Science & Sociology*	Bord Iascaigh Mhara *Fisheries Development Division* Federation of Irish Fishermen *Irish South and East Fishermen's Organisation*
2208	Marine Institute NDP Marine Research Sub-Programme (PhD Scholarship)	Spatial and Temporal Trends in Discarding Practices of the Irish Sea Demersal Trawl Fishery – Application in Discard Mitigation Plans	€105,000	42 Months	Trinity College Dublin *Department of Zoology*	
2008	Marine Institute NDP Marine Research Sub-Programme (Tender)	Pair Trawl Scouting Survey for Summer Aggregations of Herring along the West and Northwest Coasts of Ireland	€110,000	10 days	Carbery Fishing Ltd. Fintra Trawling	
2008	EU FP7 Programme (Theme 2)	DEEPFISHMAN- Management & Monitoring of Deep-Sea Fisheries & Stocks	€87,189	36 Months	IFREMER, France	Marine Institute *Fisheries Science Services*

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2007	IRCSET – ESF EUROCORES	DEECON - Unravelling Population Connectivity for Sustainable Fisheries in the Deep Sea	€194,080	36 Months	University of Oslo, Norway	University College Dublin Institute of Marine Research, Norway University of Azores, Portugal
2008	IOTI (HEA STRAND III)	Fisheries Management in a Dynamic Environment: Advancing Ireland's Applied Biostatistical Capacity	€398,399	36 Months	Galway-Mayo Institute of Technology	
2008	IOTI (HEA STRAND III)	Research for Sustainable Management of Commercial Fisheries: an Ecosystem Approach	€390,093	36 Months	Galway-Mayo Institute of Technology	
2008	IOTI (HEA STRAND I)	Data for the Sustainable Management of an Emerging Fisheries Resource	€40,000	24 Months	Galway-Mayo Institute of Technology	
2008	IOTI (HEA STRAND I)	Dab *Limanda limanda* Stocks in Irish Coastal Waters - Dynamics, Biology and Fisheries	€40,000	24 Months	Galway-Mayo Institute of Technology	
2007	IOTI (HEA STRAND I)	Early Life History of Commercially Important Flatfish Species	€40,000	24 Months	Galway-Mayo Institute of Technology	

Aquaculture

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute NDP Marine Research Sub-Programme (Project-Based Award)	Azaspiracids: Toxicological Evaluation, Test Methods and Identification of the Source Organism	€1,020,699	40 Months	Marine Institute, *Marine Environment & Food Safety Services*	Norwegian School of Veterinary Science *Institute Food Hygiene and Infection Biology* National Oceanic and Atmospheric Administration, USA *Marine Biotoxins Programme* National Research Council, Canada *Institute for Marine Biosciences* Alfred-Wegener-Institut fur Polar- und Meeresforschung, Germany *Ecological Chemistry* Dublin Institute of Technology *School of Chemical & Pharmaceutical Sciences* IFREMER, France *Department of Environment, Microbiology and Phycotoxins*
2008	Marine Institute NDP Marine Research Sub-Programme (Project-Based Award)	Investigations of Increased Mortalities on Marine Salmon Sites due to Gill Pathologies	€452,474	36 Months	Marine Institute, *Marine Environment & Food Safety Services*	Vet-Aqua International University College Cork *Coastal & Marine Resources Centre* Agri-Food & Biosciences Institute, NI *Veterinary Sciences Division* Irish Salmon Growers Association
2008	Marine Institute NDP Marine Research Sub-	Development of an AquaPlan for Irish Finfish Aquaculture	€331,174	36 Months	Marine Institute, *Marine Environment & Food Safety*	Vet-Aqua International Irish Salmon Growers Association

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
	Programme (Project-Based Award)				*Services*	IFQC Ltd
2008	EU FP7 Programme (Theme 2)	PREVENT ESCAPE- Assessing the Causes and Developing Measures to Prevent the Escape of Fish from Sea-Cage Aquaculture	€201,173	36 Months	SINTEF (Norway)	Marine Institute *Aquaculture & Catchment Management Services*
2008	EU FP7 Programme (SME Research)	SUDEVAB: Sustainable Development of European SMEs Engaged in Abalone Aquaculture	€109,920	24 Months	Aqua-Gold (Fisheries) Gmbh	National University of Ireland, Galway *Martin Ryan Institute* Jersey Sea Farms
2008	EU - INTERREG IVB	ECOFISH: Environmentally-Friendly Fish Farming and Use of Cleaner Fish	€256,231	36 Months	Bode University College, Norway	National University of Ireland, Galway *Martin Ryan Institute*
2008	EU - INTERREG IVB	ATLANTOX - Advanced Tests about New Toxins in the Atlantic Area	€137,000	36 Months	University of Santiago de Compostela	Cork Institute of Technology
2008	IRCSET (PhD Scholarship)	The Study of Gill Disease in Cultured Atlantic Salmon (*Salmo salar*, L) in Ireland With an Emphasis on the Role of Epitheliocystis as a Causative Agent: Descriptive Pathology, Aetiology and Epidemiology	€72,000	36 Months	Trinity College Dublin *Dept. of Zoology*	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2007	IOTI (HEA STRND III)	ShellTec - Energy Solutions	€389,000	36 Months	Galway-Mayo Institute of Technology *ShellTec Applied Research Centre*	
2007	IOTI (HEA STRAND III)	Dietary Analysis of Bivalve Larvae	€390,000	36 Months	Letterkenny Institute of Technology *Cambio*	
2007	BIM	Investigations into the General Biology and Breeding of Ballan Wrasse for the Provision of an Alternative, Ecological and Effective Sea Lice Treatment	€110,000	24 Months	National University of Ireland, Galway *Martin Ryan Institute*	
2007	BIM	UISCE - Understanding Irish Shellfish Culture Environment	€30,000	12 Months	National University of Ireland, Galway *Martin Ryan Institute*	

Seaweed

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU FP7 Programme People Programme	MABFUEL – Marine Algae as Biomass for Biofuel	€1,014,850	48 Months	Daithi O'Murchu Marine Research Station, Cork	Green Biofuels Ireland Ltd Dundalk Institute of Technology
2008	EU - INTERREG IVA	BioMara - Blue Energy - Sustainable Fuels from Marine Biomass	€1,000,401		Scottish Association for Marine Sciences	Sligo Institute of Technology Dundalk Institute of Technology Queen's University Belfast
2007	BIM	Establishment of High-Value Seaweed Culture - *Porphyra* Biomass Production		12 Months	National University of Ireland, Galway *Martin Ryan Institute*	
2008	IRCSET (PhD Scholarship)	Iodine in Algae – Significance in Nature and Possible Health Effects	€72,000	36 Months	National University of Ireland, Galway *Department of Botany*	
2008	IOTI (HEA STRAND III)	SEAFEED: Unlocking Bioactive Potential of Seaweed for Novel Animal Health Applications	€399,885		Waterford Institute of Technology	
2008	IOTI (HEA STRAND I)	Investigation of the Biocompatibility and Immunomodulartory Activity of Alginate Preparations for Use as Cell Encapsulation Matrices	€40,000	24 Months	Institute of Technology, Tralee	
2008	IOTI (HEA STRAND I)	Screening and Characterisation of Fucanases for Generation of Novel Bioactive Fucoidan Oligosaccharides	€40,000	24 Months	Institute of Technology, Tralee	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2007	IOTI (HEA STRAND III)	PRO-NUT: Probiotic Fermentation as a Delivery Platform for New Nutraceuticals	€344,432	36 Months	Dublin Institute of Technology *School of Food Science and Environmental Health*	
2008	Enterprise Ireland	Seaweed Products Development	€302,495		Industry Recipient	

Shipping & Maritime Transport

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU INTERREG IVB	PROPOSSE-Promotion del Short Sea Shipping y Cooperation con Pymes	€217,000	24 Months	Port Authority of Gijon	Port of Cork
2008	EU FP7 Programme (Theme 7)	European E-freight Capabilities for Co-Modal Transport	€631,588	36 Months	Transport and Mobility Leuvan, Belgium	Nautical Enterprise Centre Cork Chartered Institute of Logistics and Transport Port of Cork

Discovery Research Measure

Marine Biodiscovery /Biotechnology

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute NDP Marine Research Sub-Programme	National Marine Biotechnology Programme	€688,141	5 Years	National University of Ireland, Galway	
2008	EU INTERREG IVB	BIOTECMAR - Biotechnological Exploitation of Marine Products and By-Products	€291,778	36 Months	University of Brest	Indigo Rock Marine National University of Ireland, Galway *Irish Seaweed Centre*
2008	IOTI (HEA STRAND III)	Identification of Marine Antimicrobials as Effective Solutions to Biofouling	€399,793	36 Months	Letterkenny Institute of Technology	
2007	Enterprise Ireland Applied Research Enhancement	CAMBIO – Centre for Applied Marine Biotechnology	€500,000		Letterkenny Institute of Technology	
2008	IOTI (HEA STRAND I)	Mining Mackerel and Whelk Processing wastes as a source of Prolyl endopeptidase and Angiotensin-I-converting enzyme inhibitory peptides	€40,000	2 Years	Letterkenny Institute of Technology	
2008	DAFF FIRM	Discovery and Application of Novel Bioactive Substances from Marine Sponges for the Control of Major Food Pathogens	€323,383	36 Months	University College Cork	

Marine Functional Foods

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	DAFF FIRM	Pre-Commercialisation Evaluation of Algal Derived Prebiotic Poly and Oligosaccharides using Phenotype Micro-Array Technology	€488,704	36 Months	Tralee Institute of Technology *Department of Chemical and Life Sciences*	NUI, Galway *Molecular Glycobiotechnology Group, Department of Biochemistry*

Marine Technology

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute NDP Marine Research Sub-Programme	National Advanced Marine Technology Programme	€678,397	60 Months	Dublin City University *National Centre Sensors Research*	
2007	EPA - STRIVE	Novel Anti-fouling Stategies Based on Materials doped with Nanoparticles for use in New Monitoring Technologies	€95,000	36 Months	Dublin City University *National Centre Sensors Research*	
2007	Enterprise Ireland – Commercialisation Fund	Multi-Purpose Platform Technologies for Sub-Sea Operations	€330,000		University of Limerick *Mobile and Marine Robotics Research Centre*	
2007	Enterprise Ireland – Commercialisation Fund	PC Based Unmanned Underwater Vehicle Payload Sonar Emulation in Real Time	€150,000		University of Limerick *Mobile and Marine Robotics Research Centre*	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EPA (STRIVE – NDP) – 50% NDP Marine Research Sub-Programme 50%	Smart Catchment Demonstration: Long-term deployment of sensor monitoring system (DEPLOY)	€327,374	36 Months	Dublin City University *National Centre Sensors Research*	Tyndall National Institute Intelligent Data Systems Ltd., Clare
2008	IOTI (HEA STRAND I)	Passive Samplers for Water Quality Monitoring of Irish Marine Waters	€40,000	24 Months	Dublin Institute of Technology	

Renewable Ocean Energy

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU INTERREG IVB	MAREN-Marine Renewable Energy - Energy Extraction and Hydro-envionmental Aspects	€332,000	36 Months	Cardiff University	NUI, Galway *Dept. of Civil Engineering*
2008	Sustainable Energy Ireland - NDP	National Ocean Test Facility (NOTF)	€2,500,000	36 Months	University College Cork *Hydraulics & Maritime Research Centre*	
2008	Sustainable Energy Ireland - NDP	Development of National Wave Energy Test Sites	€500,000	24 Months	Marine Institute	
2008	IRCSET (PhD Scholarship)	Investigation of Tidal Energy Conversion through the Use of Buoyancy Mechanisms	€72,000	36 Months	NUI, Galway *Department of Mechanical & Biomedical Engineering*	
2008	IRCSET (PhD Scholarship)	Wave Forecasting for Wave Energy Applications	€72,000	36 Months	NUI, Maynooth *Department of Electronic Engineering*	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	IRCSET (PhD Scholarship)	Analysis of Power Generation System of Wave Energy Power Converter	€72,000	36 Months	University of Limerick *Department of Engineering*	
2008	IRCSET (PhD Scholarship)	Hydrodynamic Modelling of Wave Energy Conversion Device Arrays	€72,000	36 Months	University College Cork *Department of Civil & Environmental Engineering*	
2008	IRCSET (PhD Scholarship)	Hydrodynamic Behaviour of an Array of Wave-Power Devices	€72,000	36 Months	University College Dublin	
2008	IRCSET (PhD Scholarship)	Power Take-Off Technology for OWC Wave Energy Systems	€72,000	36 Months	University of Limerick *Department of Mechanical and Aeronautical Engineering*	

Policy Research Measure

Knowledge & Information Management

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2007	IOTI (HEA STRAND I)	Development of a Vertical Reference Frame - Harmonisation of Land and Marine Data	€40,000	24 Months	Dublin Institute of Technology	
2008	EPA (STRIVE – NDP)	Can Geoinformatics be used to Predict the Coastal Response to 21st Century Climate Change?	€95,000		University College Cork *Dept. of Geography*	

Socio-Economic & Legal Research

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU INTERREG IVB	MBEO- Marine Based Employment Opportunities	€5,000	5 Months	Teagasc	

Marine Environment

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU INTERREG IVA	ECOJEL: Managing the Opportunities & Detrimental Impacts of Jellyfish in the Irish Sea	€265,879	48 Months	Swansea University	University College Cork *Coastal & Marine Resources Centre*
2008	EU INTERREG IVB	ANCORIM- Atlantic Network for Coastal Risk Management	€281,000	36 Months	Regional Council of Aquitaine	Údarás na Gaeltachta NUI, Galway Mayo County Council
2008	EU INTERREG IVB	ARCOPOL-Atlantic Regions' Coastal Pollution, Response and Preparedness	€130,000	3 Years	CETMAR	Marine Institute
2008	EU INTERREG IVB	EASYCO-Collaborative Atlantic Space Biogeochemical Forecasting System	€299,980	3 Years	Instituto Superior Tecnico, Portugal	Marine Institute
2008	EU FP7 Programme (Theme 6)	HERMIONE: Hotspot Ecosystem Research and Man's Impact on European Seas	€262,164	36 Months	NERC, UK	NUI, Galway University College Cork
2008	EU INTERREG IVB	IMCORE Innovative Management for Europe's Changing Coastal Resource	€435,824	41 Months	University College Cork *Coastal & Marine Resources Centre*	National Maritime College Cork County Council Donegal County Council University of Ulster

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU FP7 Programme (Theme 6)	Knowledge-Based Sustainable Management for Europe's Seas	€128,341	48 Months	University of Plymouth	University College Cork
2008	EU FP7 Programme (Theme 6)	MESMA: Monitoring and Evaluation of Spatially Managed Areas	€325,069	48 Months	Wageningen IMARES BV, Netherlands	University College Cork *Coastal & Marine Resources Centre*
2008	EPA (STRIVE – NDP)	Assessing the Impact of Waste Water Treatment Plant Effluent on Norovirus Contamination in Shellfisheries	€330,000	36 Months	Marine Institute *Marine Environment & Food Safety*	
2008	EPA (STRIVE – NDP)	Assessment of Exposure to Metallic Nanoparticles in Marine and Fresh Water Model Organisms at Cellular and Genetic Level	€350,000		NUI, Galway	
2008	EPA (STRIVE – NDP)	SIMBIOSYS - Sectoral Impacts on Biodiversity and Ecosystem Services	€180,000 (Total project value €1.6m)	54 Months	Trinity College Dublin *Botany School*	University College Dublin *Marine Biodiversity Ecology & Evolution* University College Cork *Environmental Research Institute*
2008	IOTI (HEA STRAND III)	Acoustic Monitoring of Offshore Cetaceans	€358,941		Galway-Mayo Institute of Technology	
2007	IOTI (HEA STRAND I)	Acoustic Techniques for Conservation Management of Inshore Dolphin Populations	€40,000	24 Months	Galway-Mayo Institute of Technology	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	IRCSET (PhD Scholarship)	Comparison of Deep Sea Microbial Communities of NE Atlantic Ocean and Mediterranean Sea using DNA-Based Techniques	€72,000	36 Months	NUI, Galway *Department of Microbiology*	
2008	IRCSET (PhD Scholarship)	Investigating Variation in Whistle Structure between Parapatric Bottlenose Dolphin Communities	€72,000	36 Months	University College Cork *Aquaculture & Fisheries Development Centre*	
2008	IRCSET (PhD Scholarship)	Structural Modelling of Trachea Distortion of Leatherback Turtles during Deep Dives	€72,000	36 Months	University College Cork *Department of Agriculture*	
2007	SFI (Research Frontiers Programme)	Think Local Act Global: Quantifying the Contributions of Small Scale Terrestrial and Marine Sources to the Global Atmosphere	€117,200	36 Months	University College Cork	
2008	SFI (Research Frontiers Programme)	Biodiversity-Ecosystem Function Relationships: The Importance of Functional Diversity, Mechanism and Environmental Context	€163,000	36 Months	University College Dublin	
2008	SFI (Research Frontiers Programme)	Aerosol Mass Spectrometry Studies in the Marine and Polluted Atmosphere	€162,110	36 Months	NUI, Galway	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	SFI (Research Frontiers Programme)	Metals in the Marine Environment	€189,450	36 Months	NUI, Galway	

Rapid Ocean Climate Change

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU INTERREG IVB	Climate Change Impacts on Coastal Communities and Habitats	€5,000	5 Months	Western Isles Council, Scotland	University College Cork *Coastal & Marine Resources Centre*
2008	EU FP7 Programme Capacities Programme	EMSO - European Multidisciplinary Seas Investigation	€390,000	48 Months	Instituto Nazionale di Geofisica e Vulcanologia, Italy	Marine Institute *Ocean Science Services*
2008	EU FP7 Programme Capacities Programme	Euro Argo	€116,000	30 Months	Ifremer	Marine Institute *Ocean Science Services*
2008	FP7 - Marie Curie European Reintegration Grants	Air-Sea Fluxes of Climatically Relevant Gases in the Marine Atmospheric Boundary Layer	€100,000		National University of ireland, Galway *School of Physics*	
2008	IRCSET (PhD Scholarship)	Does the Most Recent Glacial Rebound Model for Ireland Reliably Simulate Past Relative Sea-Level?	€72,000	36 Months	Trinity College Dublin *Dept. of Geography*	
2008	IRCSET (Post Doctoral Fellowship)	Broadband Cavity-Enhanced Absorption Spectroscopy for the Characterisation of Local Sea-to-Air Exchange Processes	€66,000	24 Months	University College Cork *Dept. of Physics*	

Infrastructure Supporting Programme

Specialist Lab & Facilities

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Enterprise Ireland Research Equipment Grant	Shelltec Mass Spec	€507,000		Galway-Mayo Institute of Technology *ShellTec Applied Research Centre*	
2008	Enterprise Ireland Research Equipment Grant	Cambio	€12,700		Letterkenny Institute of Technology *Cambio*	
2007	Enterprise Ireland Research Equipment Grant	ShellTec	€90,188		Galway-Mayo Institute of Technology *ShellTec Applied Research Centre*	

Robotic Platforms

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2007	HEA - Research Equipment Renewal	ROV Latis Deployment System	€220,000	36 Months	University of Limerick *Mobile and Marine Robotics Research Centre*	
2008	HEA - Research Facilities Enhancement	ROV Topside Controls	€60,000	36 Months	University of Limerick *Mobile and Marine Robotics Research Centre*	

Research Vessel

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	EU FP7 Programme Capacities Programme	EUROFLEETS: Towards an alliance of European research fleets	€516,387	36 Months	IFREMER, France	Marine Institute

Research Vessel – Shiptime

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute /HEA Ship-Time Programme (Training)	Advanced techniques in oceanography; a joint NUIG/GMIT training cruise for early stage postgraduate and final year undergraduate students	€16,000	2 Days	NUI, Galway *Earth & Ocean Sciences*	Galway-Mayo Institute of Technology
2008	Marine Institute /HEA Ship-Time Programme (Training)	Undergraduate basic training in oceanographic and fisheries sampling at sea.	€42,000	6 Days	NUI, Galway *Earth & Ocean Sciences*	Galway-Mayo Institute of Technology
2008	Marine Institute /HEA Ship-Time Programme (Training)	Undergraduate training in basic fisheries and oceanographic sampling at sea.	€14,000	2 Days	Galway-Mayo Institute of Technology *Department of Life & Physical Sciences*	
2008	Marine Institute /HEA Ship-Time Programme (Training)	Advanced techniques in oceanography; a joint NUIG/GMIT training cruise for final year undergraduate students	€64,000	8 Days	Galway-Mayo Institute of Technology *Department of Life & Physical Sciences*	NUI, Galway
2008	Marine Institute /HEA Ship-Time Programme (Training)	NMCI Vessel familiarisation 2008	€80,000	5 Days	National Maritime College of Ireland *Nautical Studies*	
2008	Marine Institute /HEA Ship-Time Programme (Training)	Student Training in Dublin Bay	€42,000	6 Days	Trinity College Dublin *Department of Zoology*	
2008	Marine Institute /HEA Ship-Time Programme (Training)	Student Training in benthic survey & sampling techniques	€7,000	1 Day	Queen's University, Belfast *Biological Sciences*	

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute /HEA Ship-Time Programme (Training)	21st Century Graduate: Integrated Marine training for the next generation of marine scientists	€112,000	7 Days	University of Ulster, Coleraine *Centre for Coastal & Marine Research*	
2008	Marine Institute /HEA Ship-Time Programme (Integrated Research)	Detailed Bathymetric Mapping & Seabed Sampling of North Atlantic V-Shaped Ridge 'VSR-2W': Constraints on temporal variation in Mantle Convection	€400,000	25 Days	Trinity College Dublin *Department of Geology*	University of Southampton
2008	Marine Institute /HEA Ship-Time Programme (Integrated Research)	Integrated National Strategic Deep-Water Seabed Drilling Campaign (INS_DeepDrill)	€272,000	17 Days	University College Cork *Department of Geology / Environmental Research Institute*	CSA Group, NUIG, University of Bremen, University of Erlangen, Royal Netherlands Institute of Sea Research
2008	Marine Institute /HEA Ship-Time Programme (Integrated Research)	Standard Oceanographic Section cruises 1. Irish Offshore waters & 2. Irish Shelf Region	€80,000	15 Days	NUI, Galway *Earth & Ocean Sciences*	Marine Institute, *Ocean Science Services*
2008	Marine Institute /HEA Ship-Time Programme (Integrated Research)	SALSEA Merge	€100,000	15 Days	Marine Institute *Aquaculture & Catchment Management Services*	CFB, UCC, QUB, Faroese Fisheries Lab., The Loughs Agency, Agri-Food & Biosciences Institute of NI, The Atlantic Salmon Trust
2008	Marine Institute /HEA Ship-Time Programme (Integrated Research)	Reconstruction of the extent & dynamics of the British -Irish Ice Sheet on the continental margin off North West Ireland	€128,000	8 Days	Marine Institute *Ocean Science Services*	University of Ulster, Durham University

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	Marine Institute /HEA Ship-Time Programme (Bright Sparks)	Rafts, plankton and jellyfish: their value as biological indicators of different water masses?	€40,000	5 Days	Queen's University, Belfast *Ecology & Evolutionary Biology*	UCC and NUIG

Seabed & Resource Mapping

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Application of improved single beam echo-sounder classification and characterisation methods to multi-frequency INFOMAR data	€23,800		Geological Survey Ireland	
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Development of standard operating procedures for video analysis and classification, GIS integration, video visualisation and image data archiving	€24,185		NUI, Galway	Marine Institute NUI, Galway
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Environmental, biological and geochemical studies in and Dunmanus Bays and associated inner shelf areas	€30,000		AquaFact Ltd.	Dublin City University University of Toronto
2008	GSI/INFOMAR NDP Geoscience Sub-	Evaluating Irish Marine Palaeoclimate Records -	€39,688		NUI, Maynooth	Trinity College Dublin

Year	Funding Source & Type	Project Name	Grant-Aid (agreed)	Project Duration	Lead Partner	Partners
	Programme	EIMeR				University College Dublin
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	GIS integration of Irish onshore and offshore LiDAR datasets to create new value-added geospatial datasets	€29,445		NUI, Maynooth	
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Holocene climate change on the western Irish seaboard employing foraminiferal analysis of sediment cores from Galway Bay	€28,740		NUI, Galway	
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Multibeam seabed mapping: correlating acoustic backscatter returns to ground-truthing using statistical tools. Developing a bio-geological classification scheme	€28,493		University College Dublin	Geological Survey Ireland
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Palaeoceanographic records of abrupt climate change: a preliminary investigation	€29,625		Trinity College Dublin	
2008	GSI/INFOMAR NDP Geoscience Sub-Programme	Prototype toolset for evaluating automated image processing of sub-sea video data	€28,012		NUI, Maynooth	

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